

however, always separable from females of *N. t. talatala* when in worn dress.

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To augment the series in the Durban Museum, additional material was borrowed from the South African Museum, Cape Town, the State Museum Windhoek, the Natal Museum, Pietermaritzburg, the Transvaal Museum, Pretoria and the National Museum of Rhodesia, Bulawayo. To the responsible officials I tender my thanks.

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Breeding biology of *Lamprotornis mevesii* (Wahlberg)

by R. J. DOWSETT

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Brooke (1965) has summarised what is known of the breeding of the Long-tailed Starling *Lamprotornis mevesii* (Wahlberg), but he is able to give no information on incubation and nestling periods. The present paper records the nestling period and the growth of nestlings observed in a nest at M'fuwe, Luangwa Valley, Zambia ($13^{\circ} 05' S$: $31^{\circ} 50' E$), in March, 1966. This nest is the first to be found in Zambia (Brooke, *op. cit.*). Nest excavation, as observed in the same area in February, 1967, is also described. The species is numerous on alluvial soils in the Luangwa Valley, mainly in *Colophospermum mopane* Leon. woodland, but the area is difficult of access in the rains when the species is breeding.

Nest excavation

On 11th February, 1967, a pair of *L. mevesii* started excavating a hole in a *Kigelia pinnata* tree, only some 10 feet from the tree in which they had nested in March, 1966. They were considered to be the same pair that had nested before, the presumed male having been caught and ringed in March, 1966 and the presumed female being unringed. When the male visited the nest-hole the number on his ring could be read clearly through a x40 telescope. The hole was a natural one and was in the side of an almost vertical branch, some 12 feet above the ground. The hole was about six inches deep and contained rather loose and rotting wood.

Excavation was daily, but was casual and mainly between 0700 and 1000 hours local time. Only the female was seen to excavate. The male usually sat higher up in the tree, and would call when the female entered the nest-hole, often flying down to peer in when she was inside. Sometimes he would fly away with her when she left the hole with wood-chips, which she usually carried in her beak for about 25 yards. On 16th February, she started carrying a few twigs into the hole, but she was still occupied with excavation. On one occasion the male carried a large chip of wood into the hole, only for it to be removed promptly by the female on her next visit. The male seldom entered the hole, and was never again seen to carry anything.

From 18th February another starling joined the male of the pair, and it was found to be one of the chicks hatched by this pair in March, 1966 (it had been ringed). For the next few days the youngster joined the male in encouraging the female, but doing little else. It was tolerated by the pair, unlike Red-billed Wood-hoopoes *Phoeniculus purpureus* (Miller) and a Striped Kingfisher *Halcyon chelicuti* (Stanley) which visited the hole only to be chased off by the pair of starlings.

The female continued to excavate and to take in a little nesting material until 24th February when all three birds unaccountably left the area and were not seen again.

Description of nest

The nest found in March, 1966 was made solely of dead fibre and twigs in a hole in a live Cape Mahogany tree *Trichilia emetica* Vahl. The nest chamber was 12 inches deep in the side of a dead branch, eight feet from the ground and at an angle of 45° from the horizontal. There were two entrance holes, the lower one in the side of the branch about four feet up from the tree trunk, the other a further three feet up, beneath the branch. The holes were apparently natural. Both entrances faced approximately west, but this is probably of little significance as a grove of trees provided day-long shade.

Description of nestlings

Two nestlings were examined from the nest on 19th March when they were considered to be one day old (fig. 1). They were naked except for dirty white down on crown, sides of neck and, especially abundant, down the spine. They seemed just able to distinguish light from dark. The gape was bright yellow, but with age this became duller. Nestlings of the closely



Fig. 1. *Lamprotornis mevesii* chick one day old

related *L. australis* (Smith) at about four days old had dull yellow gapes (Benson and Pitman, 1966). The prominent gape flange was whitish.

To avoid undue disturbance the nest was not examined closely again until day six (fig. 2). A third nestling was then found in the nest, and it was either hatched several days after the other two or was retarded in its development, as it remained much smaller than the others throughout the nestling period (fig. 3 taken on day seven).

The pterylosis of this small individual was examined on day ten. Spinal, femoral, humeral, crural, ulnar and ventral feather tracts were present. The inner and outer supraorbital and occipital tracts were poorly defined, most feather development on the sides of the head radiating from the crown (continuation of the spinal tract) and malar region.

Growth of nestlings

All three nestlings were weighed and measured daily, between 1400 and 1600 hours local time, from day seven until day 16, when examination was stopped to avoid premature flight from the nest. Fig. 4 shows the youngest nestling and one of the older ones on day 14. All three finally left the nest on 9th April at 22 days old.

Wing length and weight increases are shown in fig. 5. Data are compared with the measurements of seven birds of the year and seven adults caught and ringed in the same area in October, 1966. In addition one of the nesting adult *L. mevesii* which was caught and ringed on 17th March, about the time of hatching (it was not then known there was a nest in the same area) had a wing of 145 mm. and a weight of 81.5 gms. This adult was probably the male as its wing length is within the range for male specimens from the Luangwa Valley (Irwin and Benson, 1967). It



Fig. 2. *Lamprotornis mevesii* chick at day six



Fig. 3. *Lamprotornis mevesii* chicks at day seven

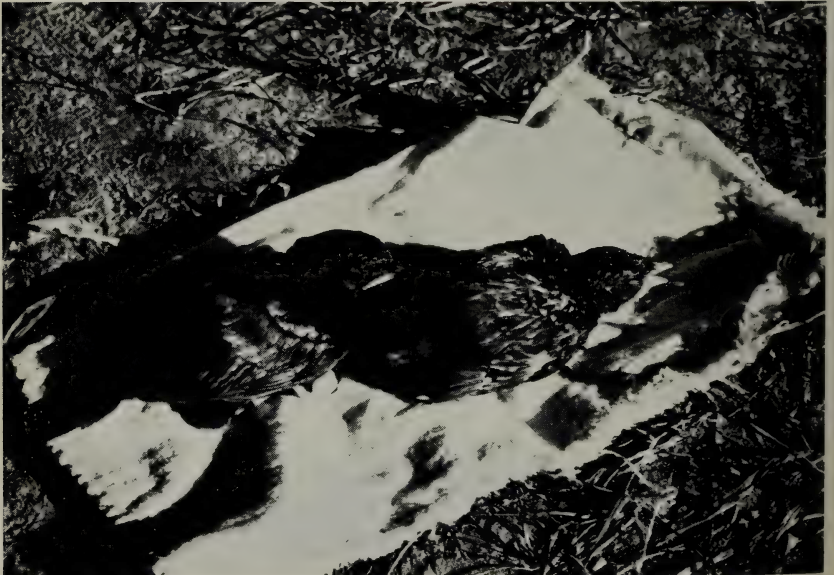


Fig. 4. *Lamprotornis mevesii* chicks at day 14

did not appear to brood the nestlings, although it was seen to feed them as much as the unringed bird of the pair. Fig. 5 also includes data from an independent juvenile collected from a party on 19th June. It will be seen that growth was steady throughout the period of observation, but that near adult weight was reached earlier than near adult wing size, and that at the time of fledging the wing had still to grow a good deal.

The growth of the bill, tarsus and tail is shown in fig. 5, the data being compared with the measurements of the birds caught in October. As the base of the bill and forehead are ill-defined in young birds, bill measurements were taken from the nostril. The bills of the October sample were also measured from the skull in the normal manner, results being:

	Range	Mean	Sample
Adults	21.5—22.5 mm.	22.0	7
Birds of the year	20.5—23.0 mm.	21.5	7

The tails of two adults were heavily abraded and are not included in fig. 5. The tarsus, but not the bill, appears to be fully developed at an early age, whereas tail growth continues well after fledging (see Saunders in Brooke, 1965).

Wing feather quills were evident by day six, and by day eight the primaries were emerging. By day nine femoral, ventral (slight) and ulnar tracts were sprouting, and the emergent feathers were glossy blue-green. By day ten the quills of all feather tracts were sprouting. The smallest nestling's development was some two or three days behind this. In all nestlings the last areas to be covered by feathers were the sides of the breast, from belly to neck, which remained bare to at least day 16. By day 16 the colour of the nestling's plumage was very similar to that of the adult, being slightly blacker, less glossy at the base of feathers. Benson (*in litt.*) kindly gives information on the three specimens collected by Ansoze at Mossamedes, Angola, on 22nd April, 1906 and mentioned by Brooke (1965). They have wings of 105, 105 and 99 mm. and tails of 59, 50 and 57 mm. All are fully feathered and the colour of adults, except that the belly, rump and upper tail-coverts have reddish rather than bronzy iridescences, which is in accordance with the findings of Brooke (1967). Benson considers there are also slight indications of buffy tips to the chest feathers. These specimens are in the American Museum of Natural History, where Benson examined them.

The colour of the tarsus was originally off-white or leaden, but slowly darkened in blotches to blackish. The whitish bill darkened slowly, at first the upper mandible only. The eye was brown with a dark blue centre as in adults.

Weather appeared to have no effect on daily growth rates. The nestlings seemed to be fed entirely on insects and caterpillars which were readily available.

Nestling parasites

Mites were present on the nestlings and in the nest in very large numbers from day 15 but not prior to that. Specimens have been identified as the Tropical Fowl Mite *Ornithonyssus bursa* (Berlese), family Dermanyssidae, by the British Museum (Natural History). This is a widespread tropical species that parasitizes both wild and domestic birds. Several of the birds

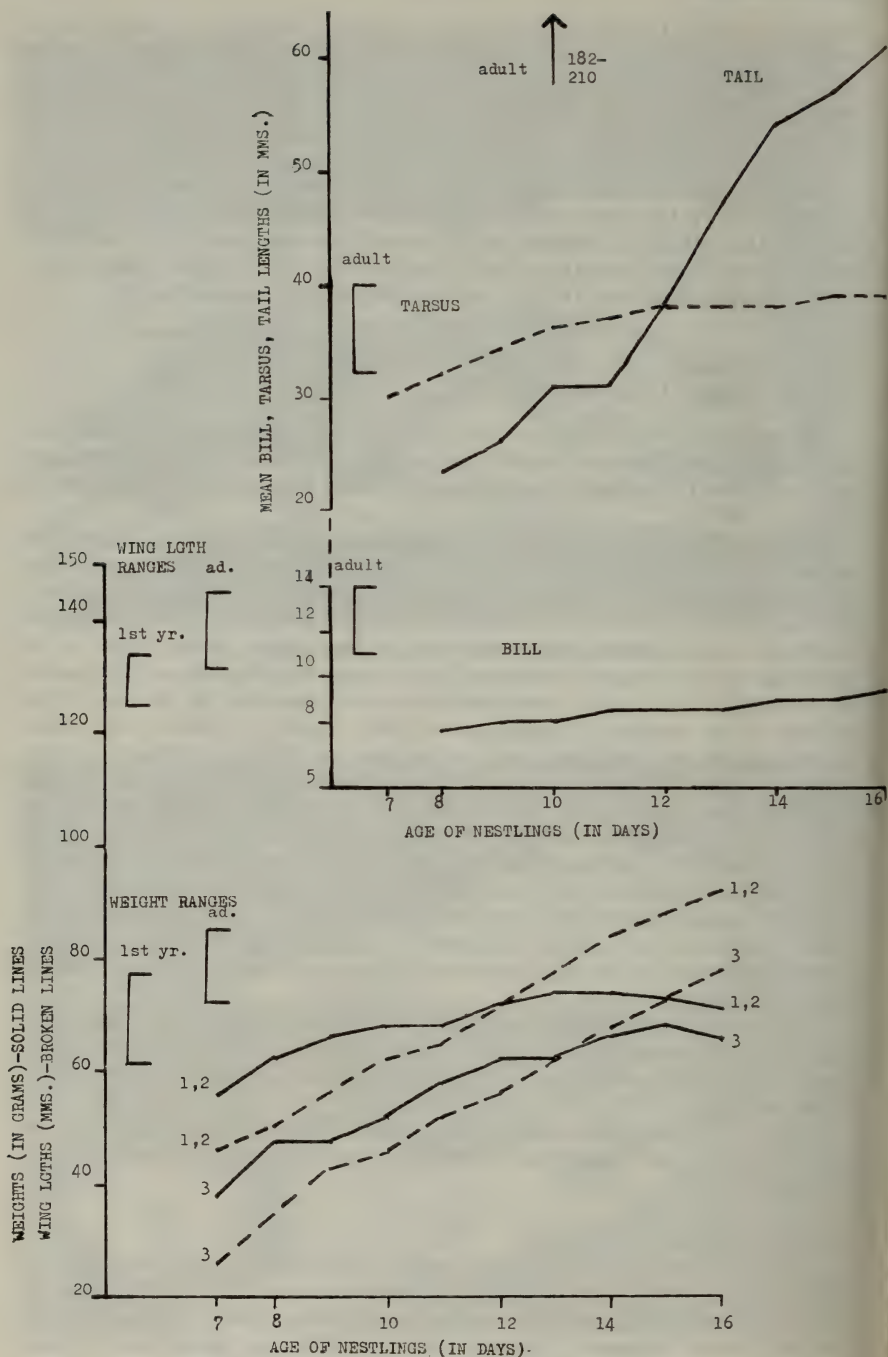


Fig. 5. Breeding biology of *Lamprotrornis mevesii*

caught for ringing in October carried a large number of apparently similar mites, but none was collected.

Behaviour during the nestling period

Both adults fed the nestlings, but only the unringed bird (presumably the female) was observed to brood them, although too little time could be spent observing this nest for firm conclusions to be drawn. This pair may have nested unobserved prior to the present occurrence, but Brooke (*in litt.*) considers the species probably single brooded as it has a relatively long nestling and a very long fledgling period. A fledgling collected by M. P. Stuart Irwin near Nuanetsi, Rhodesia, on 27th April was still being fed by its parents although it had a fully grown tail and only a trace of gape flange. This specimen is now in the National Museum, Bulawayo, Rhodesia (Brooke, 1967 and *in litt.*). The present pair left the immediate vicinity after the young left the nest and their movements thereafter could not be followed, although it is known one of the fledglings was in the area in October (see *Post-breeding behaviour*).

The adults entered the nest by the main entrance hole beneath the branch, the one further away from the nest. They entered the top hole head first, and passed by the bottom hole head first, evidently turning around in the nest chamber before brooding or after feeding (*cf.* Cackett in Brooke, 1965). The diameter of the nest cavity was about seven inches. When the nestlings were removed from the nest for examination the adults merely scolded from a distance; only on day 16, the last day of examination, did the adults mob the observer and that was when the largest nestling left the nest prematurely. This pair showed the noisy intolerance of other species near the nest which is typical of *L. mevesii* in the Luangwa Valley, where several obvious pairs have been noted, although nests not found (*cf.* Cackett in Brooke, 1965). On one occasion both adults mobbed an Angola Kingfisher *Halcyon senegalensis* (Linn.) that ventured too near the nest. In February 1967 a starling, not one of the pair under observation, was seen to mob a Great Spotted Cuckoo *Clamator glandarius* (Linn.), a species that may well parasitize *L. mevesii* in this area (see footnote to Brooke, 1967).

The nestlings called whilst being fed, or when disturbed in the nest, from day 1. A quiet "cheep, cheep" became louder and harsher as they grew older. Bill-snapping when disturbed in the nest commenced on day 14. The two larger nestlings were always nearer the lower entrance hole than the smaller one, and presumably were fed before it was. From day 15 the two larger nestlings at least climbed to this entrance hole to defaecate from it. The largest left the nest of its own accord on day 16, but was returned as it could fly but weakly. From day 19 the two larger nestlings at least spent a lot of their time at the lower entrance hole, and all three left the nest and its immediate vicinity early on day 22.

Post-breeding behaviour

In early October a flock of about 40 *L. mevesii* appeared in the vicinity of the nest and fed for several days on the fallen ripe fruits of the tree *Diospyros mespiliformis* Hochst. Fourteen were caught and ringed and their measurements have been used earlier in this paper. One of the fledglings was seen in this flock (it was the only one to be ringed on the left leg) but it could not be recaptured. This was the same bird that appeared in the area again during nest excavation in February, 1967. The birds caught

were aged by the presence or absence of copper iridescences on the flanks (see Brooke, 1967). Five adults had commenced the moult of their primary feathers, whilst two had fairly unworn primaries with no trace of moult. All seven had fairly fresh secondaries. The seven considered to be birds of the year were all in a state similar to that of the moulting adults. The breeding adult caught and ringed on 17th March showed little plumage wear, and Brooke (1967) has shown that the species has a complete pre-nuptial moult.

Two birds of this party were observed copulating on 6th October, but not subsequently (see Cackett in Brooke, 1967).

Outside the breeding season *L. mevesii* seems to feed to a great extent on fruits, which are most plentiful at the end of the dry season, say October to December. A flock of 150 seen in the Luangwa Valley on 17th July were feeding in *Acacia albida* Del. trees, apparently on the flowers, but possibly also on tender young fruits. My colleague W. L. Astle tells me he can think of no fruiting trees that would be available to *L. mevesii* during the breeding season in the Luangwa Valley, and observations at this nest confirm that the species is then mainly insectivorous.

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An unusual record of the Golden Pipit *Tmetothylacus tenellus* (Cabanis)

by B. W. H. STRONACH

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In February, 1967, three male Golden Pipits (*Tmetothylacus tenellus*) were collected at Mweka, northern Tanzania (3° 15' S., 37° 20' E.). Mweka is situated at 4,500 ft. on the southern slopes of Mt. Kilimanjaro, about eight miles north of Moshi.

This is the first record of this species at Mweka and an unusual one in that these birds are usually found in very dry semi-desert country with a rainfall of about 15 inches per annum, whereas the vegetation at Mweka is described as the lower edge of the montane forest and has a rainfall of 45 inches per annum.

Over the past three years frequent visits have been made to the Tsavo (west) National Park in Kenya (3° 5' S., 37° 50' E.), at all seasons of the year and it was found that these pipits were present there in large numbers in April, May and June but in the early or later months of the year very